SEQUENCE LISTING

<110> Brookhaven Science Associates
Shanklin, John
Whittle, Edward J.

<120> Mutant Fatty Acid Desaturase and Methods for Directed Mutagenesis

<130> CIP of 10/017,145 filed December 14, 2001 which was a CIP of 09/328,550 filed on June 9, 1999, which was a CIP of 09/233,856 filed on January 19, 1999

<140> 10/822,370
<141> 2004-04-12

<150> 09/328,550
<151> 1999-06-09

<150> 10/017,145
<151> 2001-12-14

<150> 09/233,856
<151> 1999-01-19

<160> 19

<170> PatentIn version 3.2

<210> 1
<211> 363
<212> PRT
<213> Ricinus communis

<220>
<221> misc_feature
<223> ricinus communis delta 9 18:0 Acyl ACP Desaturase

<400> 1

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Ala Ser Thr Leu Lys Ser Gly Ser Lys Glu Val Glu Asn Leu Lys Lys
1               5                   10                  15


Pro Phe Met Pro Pro Arg Glu Val His Val Gln Val Thr His Ser Met
            20                  25                  30


Pro Pro Gln Lys Ile Glu Ile Phe Lys Ser Leu Asp Asn Trp Ala Glu
        35                  40                  45


Glu Asn Ile Leu Val His Leu Lys Pro Val Glu Lys Cys Trp Gln Pro
    50                  55                  60
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Gln Asp Phe Leu Pro Asp Pro Ala Ser Asp Gly Phe Asp Glu Gln Val
65                  70                  75                  80

Arg Glu Leu Arg Glu Arg Ala Lys Glu Ile Pro Asp Asp Tyr Phe Val
                85                  90                  95

Val Leu Val Gly Asp Met Ile Thr Glu Glu Ala Leu Pro Thr Tyr Gln
            100                 105                 110

Thr Met Leu Asn Thr Leu Asp Gly Val Arg Asp Glu Thr Gly Ala Ser
        115                 120                 125

Pro Thr Ser Trp Ala Ile Trp Thr Arg Ala Trp Thr Ala Glu Glu Asn
    130                 135                 140

Arg His Gly Asp Leu Leu Asn Lys Tyr Leu Tyr Leu Ser Gly Arg Val
145                 150                 155                 160

Asp Met Arg Gln Ile Glu Lys Thr Ile Gln Tyr Leu Ile Gly Ser Gly
                165                 170                 175

Met Asp Pro Arg Thr Glu Asn Ser Pro Tyr Leu Gly Phe Ile Tyr Thr
            180                 185                 190

Ser Phe Gln Glu Arg Ala Thr Phe Ile Ser His Gly Asn Thr Ala Arg
        195                 200                 205

Gln Ala Lys Glu His Gly Asp Ile Lys Leu Ala Gln Ile Cys Gly Thr
    210                 215                 220

Ile Ala Ala Asp Glu Lys Arg His Glu Thr Ala Tyr Thr Lys Ile Val
225                 230                 235                 240

Glu Lys Leu Phe Glu Ile Asp Pro Asp Gly Thr Val Leu Ala Phe Ala
                245                 250                 255

Asp Met Met Arg Lys Lys Ile Ser Met Pro Ala His Leu Met Tyr Asp
            260                 265                 270

Gly Arg Asp Asp Asn Leu Phe Asp His Phe Ser Ala Val Ala Gln Arg
        275                 280                 285
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Leu Gly Val Tyr Thr Ala Lys Asp Tyr Ala Asp Ile Leu Glu Phe Leu
290 295 300

Val Gly Arg Trp Lys Val Asp Lys Leu Thr Gly Leu Ser Ala Glu Gly
305 310 315 320

Gln Lys Ala Gln Asp Tyr Val Cys Arg Leu Pro Pro Arg Ile Arg Arg
325 330 335

Leu Glu Glu Arg Ala Gln Gly Arg Ala Lys Glu Ala Pro Thr Met Pro
340 345 350

Phe Ser Trp Ile Phe Asp Arg Gln Val Lys Leu
355 360

<210> 2
<211> 1092
<212> DNA
<213> Ricinus communis

<220>
<221> misc_feature
<223> residues 138 to 1239 of open reading frame

<400> 2
gcctctaccc tcaagtctgg ttctaaggaa gttgagaatc tcaagaagcc tttcatgcct 60

cctcgggagg tacatgttca ggttacccat tctatgccac cccaaaagat tgagatcttt 120

aaatccctag acaattgggc tgaggagaac attctggttc atctgaagcc agttgagaaa 180

tgttggcaac cgcaggattt tttgccagat cccgcctctg atggatttga tgagcaagtc 240

agggaactca gggagagagc aaaggagatt cctgatgatt attttgttgt tttggttgga 300

gacatgataa cggaagaagc ccttcccact tatcaaacaa tgctgaatac cttggatgga 360

gttcgggatg aaacaggtgc aagtcctact tcttgggcaa tttggacaag ggcatggact 420

gcggaagaga atagacatgg tgacctcctc aataagtatc tctacctatc tggacgagtg 480

gacatgaggc aaattgagaa gacaattcaa tatttgattg gttcaggaat ggatccacgg 540

acagaaaaca gtccatacct tgggttcatc tatacatcat tccaggaaag ggcaaccttc 600

atttctcatg ggaacactgc ccgacaagcc aaagagcatg gagacataaa gttggctcaa 660

atatgtggta caattgctgc agatgagaag cgccatgaga cagcctacac aaagatagtg 720

gaaaaactct ttgagattga tcctgatgga actgttttgg cttttgctga tatgatgaga 780

aagaaaattt ctatgcctgc acacttgatg tatgatggcc gagatgataa tctttttgac 840

cacttttcag ctgttgcgca gcgtcttgga gtctacacag caaaggatta tgcagatata 900

ttggagttct tggtgggcag atggaaggtg gataaactaa cgggcctttc agctgaggga 960

caaaaggctc aggactatgt ttgtcggtta cctccaagaa ttagaaggct ggaagagaga 1020

gctcaaggaa gggcaaagga agcacccacc atgcctttca gctggatttt cgataggcaa 1080

gtgaagctgt ag 1092

<210> 3
<211> 34
<212> DNA
<213> Artificial

<220>
<223> amplification primer

<220>
<221> misc_feature
<223> PCR primer; sequence flanking unique XbaI site at the 5' end of the open reading frame

<400> 3
gtgagcggat aacaatttca cacagtctag aaat 34

<210> 4
<211> 72
<212> DNA
<213> Artificial

<220>
<223> amplification primer

<220>
<221> misc_feature
<222> (56)..(57)
<223> PCR primer is a degenerate oligonucleotide in which "n" indicates the presence of either C, A, T or G at that nucleotide position

<400> 4
ccaaattgcc caagacgtcg gacttgcacc tgtttcatcc cgaactccat ccaamnnatt 60

cagcattgtt tg 72

<210> 5
<211> 31
<212> DNA
<213> Artificial

<220>
<223> amplification primer

<220>
<221> misc_feature
<223> PCR primer

<400> 5
gaaacaggtg caagtccgac gtcttgggca a 31

<210> 6
<211> 26
<212> DNA
<213> Artificial

<220>
<223> amplification primer

<220>
<221> misc_feature
<223> PCR primer

<400> 6
gttttctgtc cgcggatcca ttcctg 26

<210> 7
<211> 34
<212> DNA
<213> Artificial

<220>
<223> amplification primer

<220>
<221> misc_feature
<223> PCR primer

<400> 7
gtgagcggat aacaatttca cacagtctag aaat 34

<210> 8
<211> 30
<212> DNA
<213> Artificial

<220>
<223> amplification primer

<220>
<221> misc_feature

<223> PCR primer

<400> 8
cacgaggccc tttcgtcttc aagaattctc 30

<210> 9
<211> 28
<212> DNA
<213> Artificial

<220>
<223> amplification primer

<220>
<221> misc_feature
<223> PCR primer

<400> 9
ttgataagtg ggaagggctt cttccgtt 28

<210> 10
<211> 66
<212> DNA
<213> Artificial

<220>
<223> amplification primer

<220>
<221> misc_feature
<222> (32)..(34)
<223> PCR primer is degenerate olignucleotide in which "n" indicates the presence of either C, A T, or G at that nucleotide position and in which "k" indicates either T or G

<220>
<221> misc_feature
<222> (41)..(43)
<223> PCR primer is a degenerate oligonucleotide in which "n" indicates the presence of either C, A, T or G and in which "k" indicates the presence of either T or G.

<220>
<221> misc_feature
<222> (44)..(46)
<223> PCR primer is a degenerate oligonucleotide in which "n" indicates the presence of either C, A, T, or G at that nucleotide position and in which "k" indicates the presence of either T or G.

<400> 10
aacggaagaa gcccttccca cttatcaaac annkctgaat nnknnkgatg gagttcggga 60

tgaaac 66

<210> 11
<211> 26
<212> DNA
<213> Artificial

<220>
<223> amplification primer

<220>
<221> misc_feature
<223> PCR primer

<400> 11
tccattcctg aaccaatcaa atattg 26

<210> 12
<211> 70
<212> DNA
<213> Artificial

<220>
<223> amplification primer

<220>
<221> misc_feature
<222> (22)..(24)
<223> PCR primer in a degenerate oligonucleotide in which "n" indicates the presence of either C, A, T or G at that nucleotide position and in which "k" indicates the presence of either T or G at that nucleotide position.

<220>
<221> misc_feature
<222> (28)..(30)
<223> PCR primer in a degenerate oligonucleotide in which "n" indicates the presence of either C, A, T or G at that nucleotide position and in which "k" indicates the presence of either T or G at that nucleotide position.

<220>
<221> misc_feature
<222> (49)..(51)
<223> PCR primer in a degenerate oligonucleotide in which "n" indicates the presence of either C, A, T or G at that nucleotide position and in which "k" indicates the presence of either T or G at that nucleotide position.

<400> 12
ttgattggtt caggaatgga tnnkcggnnk gaaaacagtc cataccttnn kttcatctat 60

acatcattcc 70

<210> 13
<211> 30
<212> DNA
<213> Artificial

<220>
<223> amplification primer

<220>
<221> misc_feature
<223> PCR primer

<400> 13
gcaaaagcca aaacggtacc atcaggatca 30

<210> 14
<211> 59
<212> DNA
<213> artificial

<220>
<223> amplification primer

<400> 14
ccaaaagaaa aaggtaagaa aacccgggat ggctctcaag ctcaatcctt tcctttctc 59

<210> 15
<211> 31
<212> DNA
<213> artificial

<220>
<223> amplification primer

<400> 15
ttgctctctc cctgagttcc ctgacttgct c 31

<210> 16
<211> 31
<212> DNA
<213> artificial

<220>
<223> amplification primer

<400> 16
gagcaagtca gggaactcag ggagagagca a 31

<210> 17
<211> 38
<212> DNA

<213> artificial

<220>
<223> amplification primer

<400> 17
tcctttgacc ttccttgggc tctctcttcc agccttct 38

<210> 18
<211> 37
<212> DNA
<213> artificial

<220>
<223> amplification primer

<400> 18
gaaggctgga agagagagcc caaggaaggg caaagga 37

<210> 19
<211> 42
<212> DNA
<213> artificial

<220>
<223> amplification primer

<400> 19
tgaattcgat atcgagctct acagcttcac ttgcctatcg aa 42